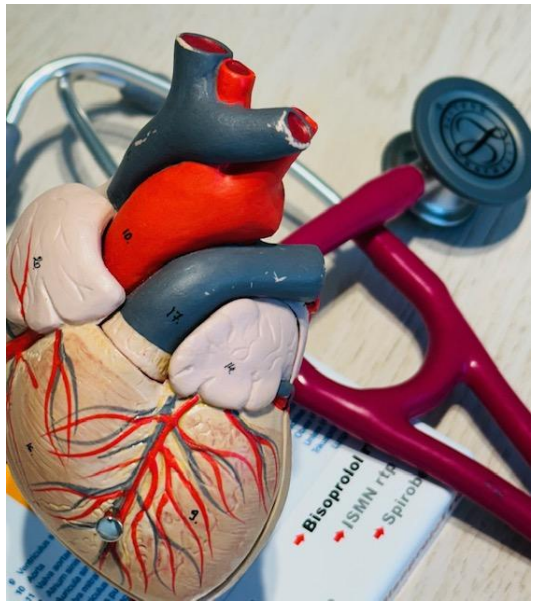
Why the gut - heart axis matters – it‘s not only about genes, lifestyle plays a key role in prevention









Dr. Theresa Thurner
Cardiologist at Lanserhof Lans
23.10.2026

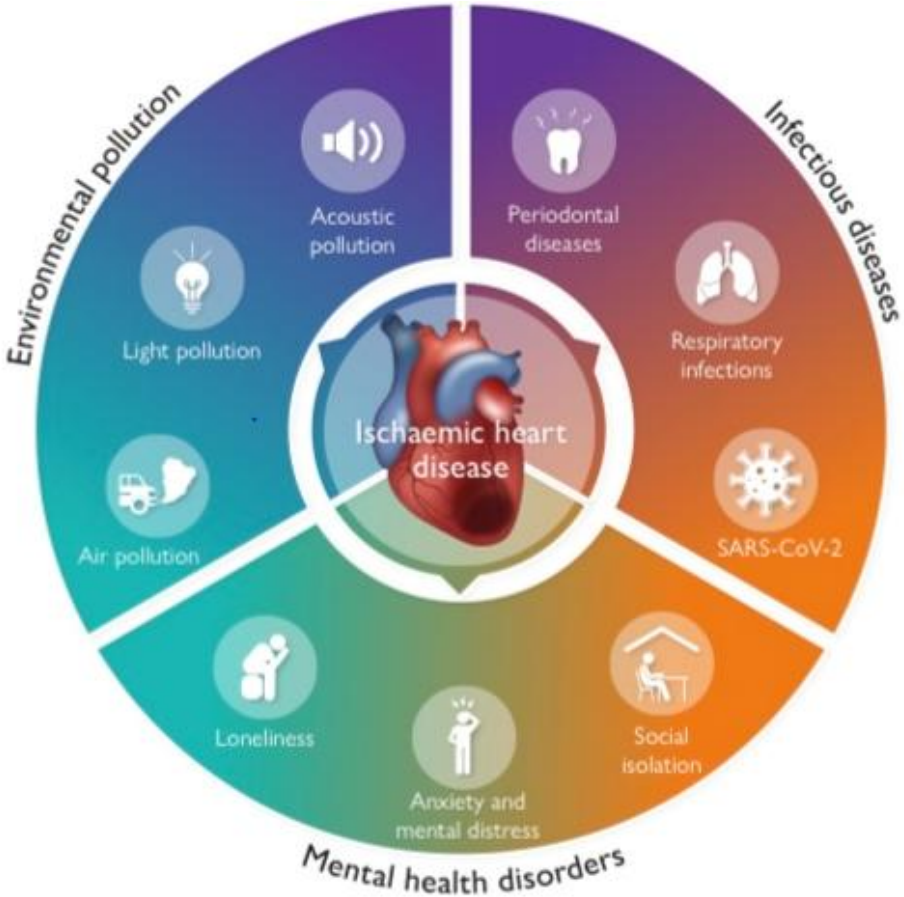


Κάλλιον το προλαμβάνειν ἢ το θεραπεύειν

(Better to prevent than to cure.)

Hippocrates , 460-370 BC

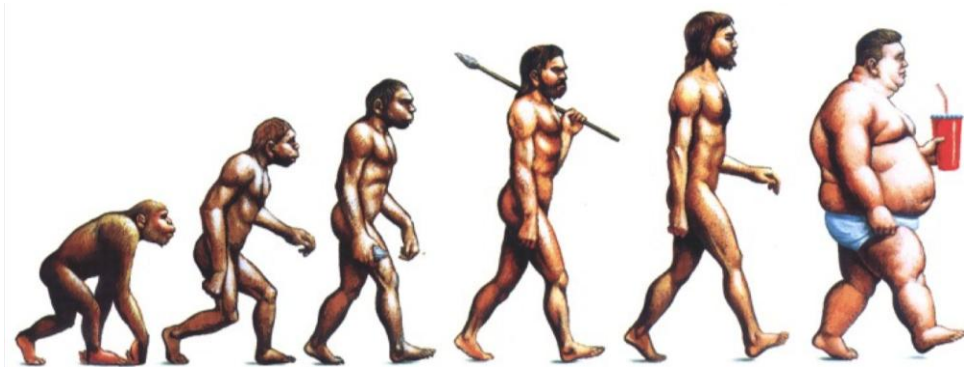
The Exposome

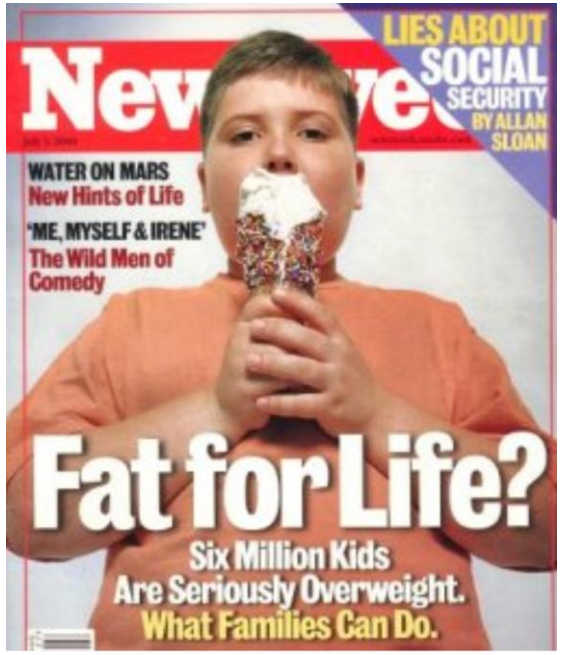


A.Montone, Massiliamo Camilli et al;Exposome in ischaemic heart disease: beyond traditional risk factors; european heart journal 2024

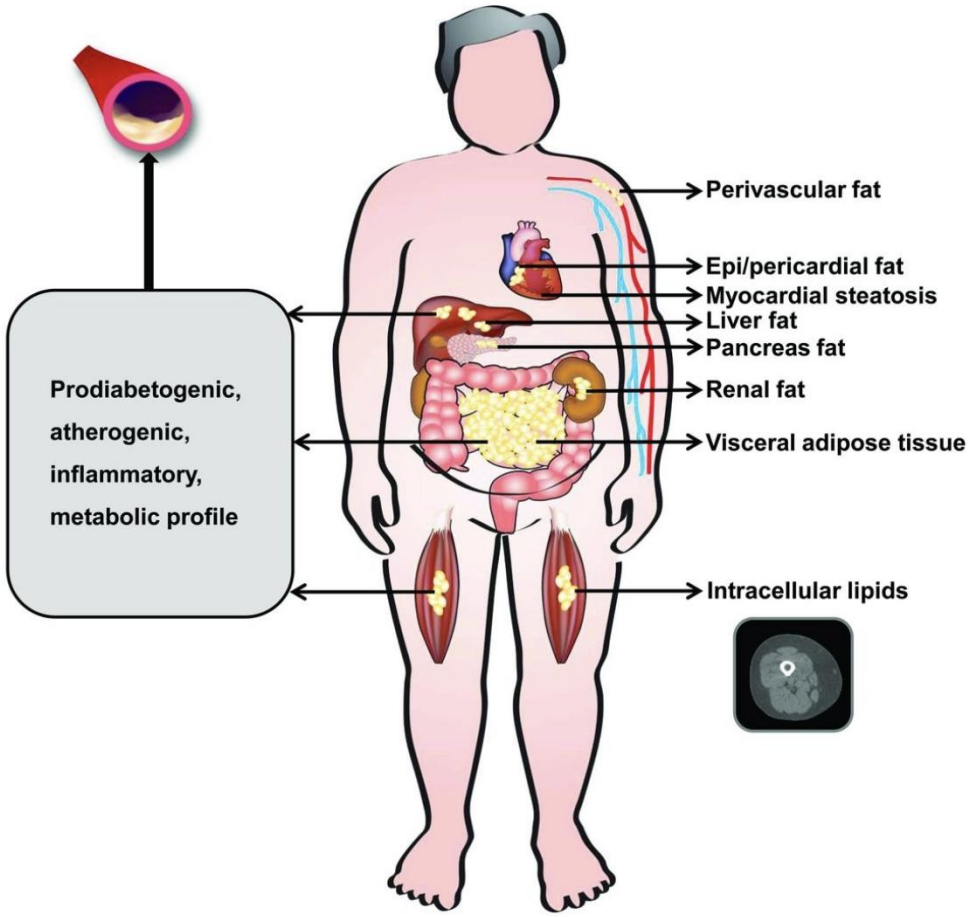
The pitfalls of evolution





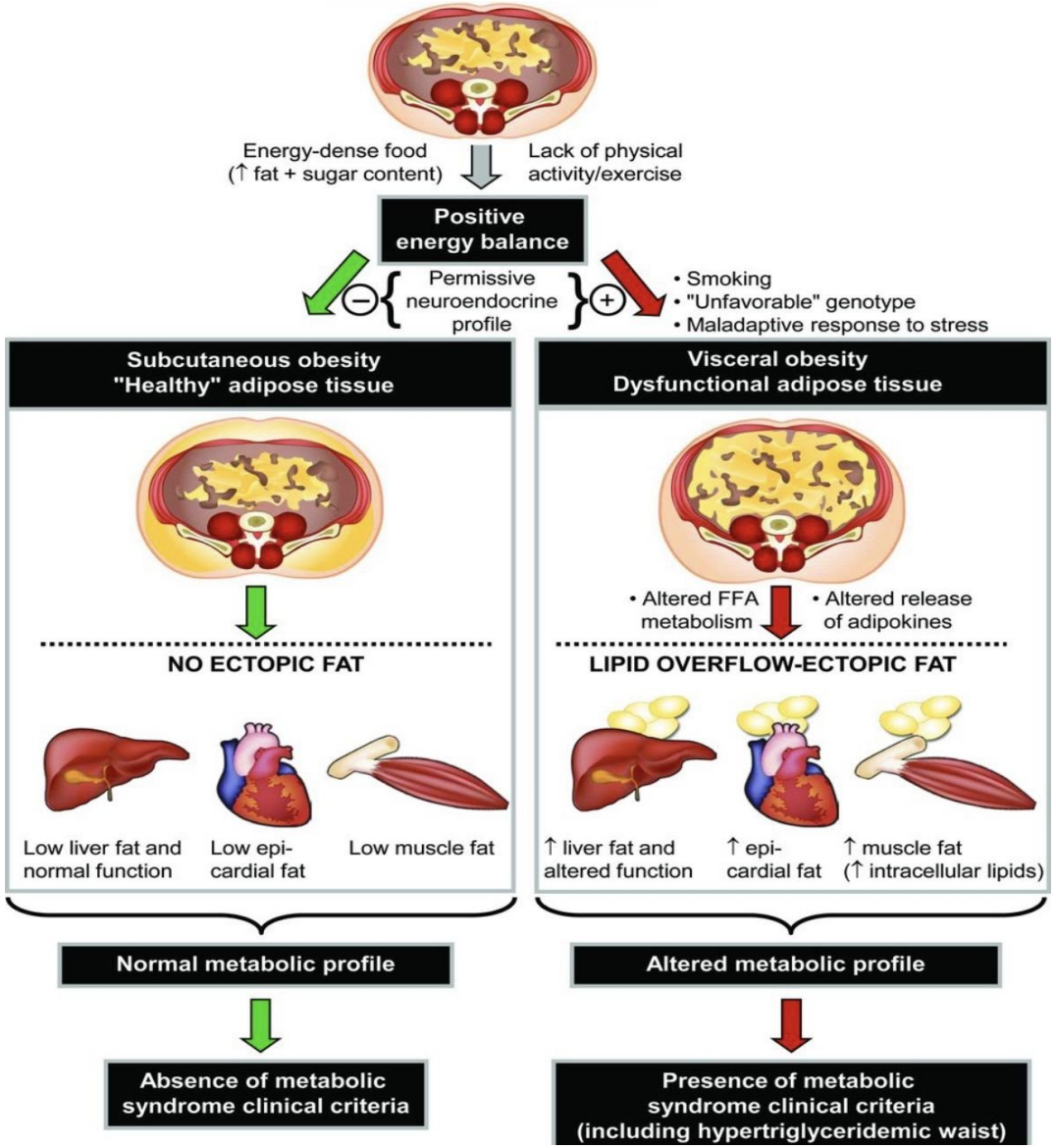


Body fat distribution and cardiovascular risk



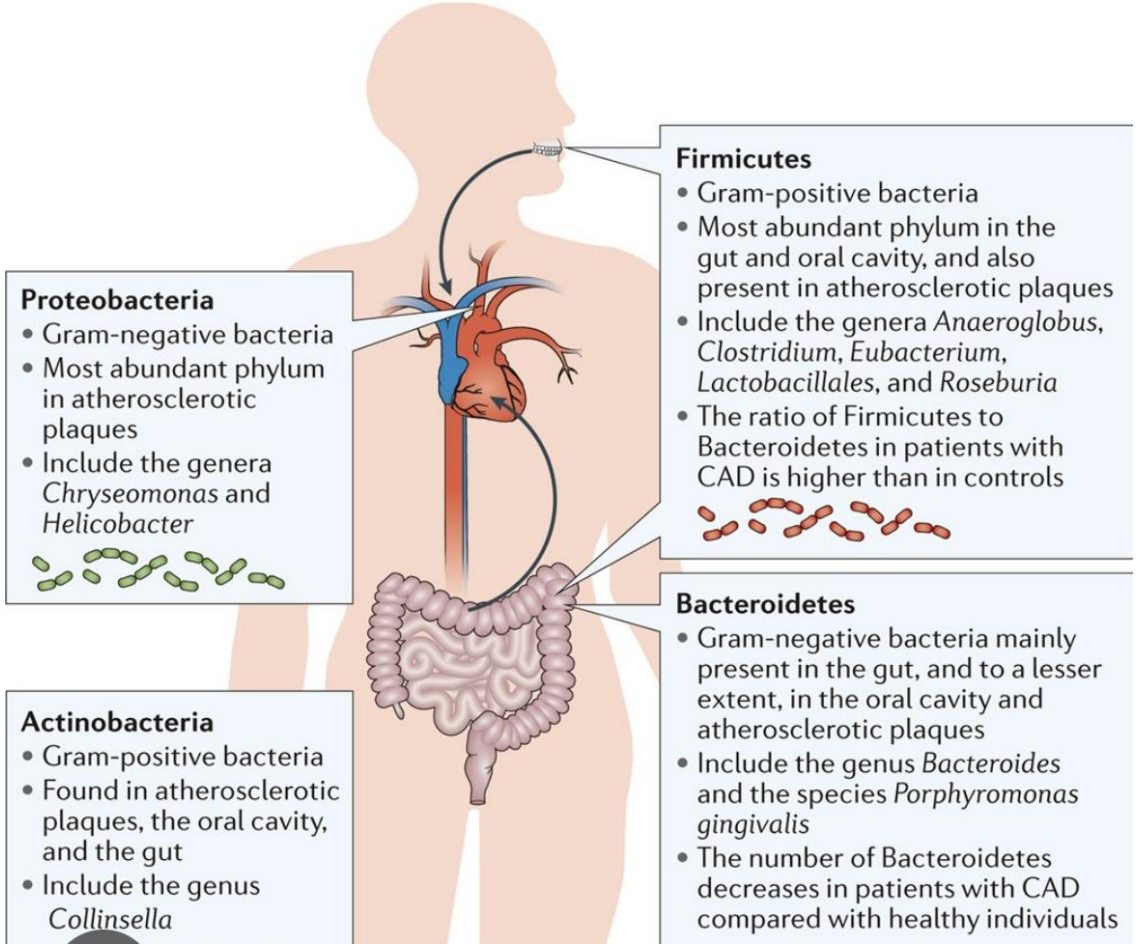
Body fat distribution and risk of cardiovascular diseases; Jean-Pierre Despres et al;Circulation

Visceral obesity as risk factor



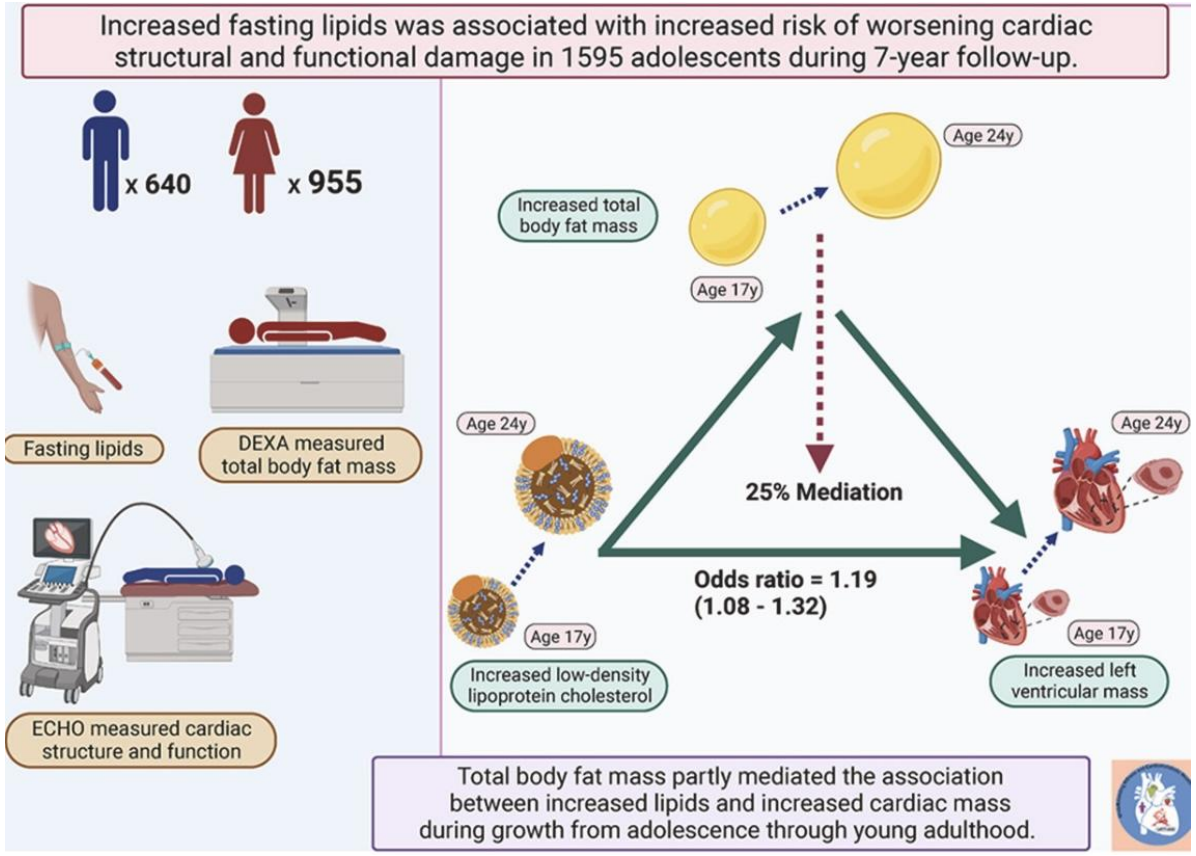
Body fat distribution and risk of cardiovascular diseas;Jean-Pierre Despres et al; Circulation 2012

...the microbiome in our plaques



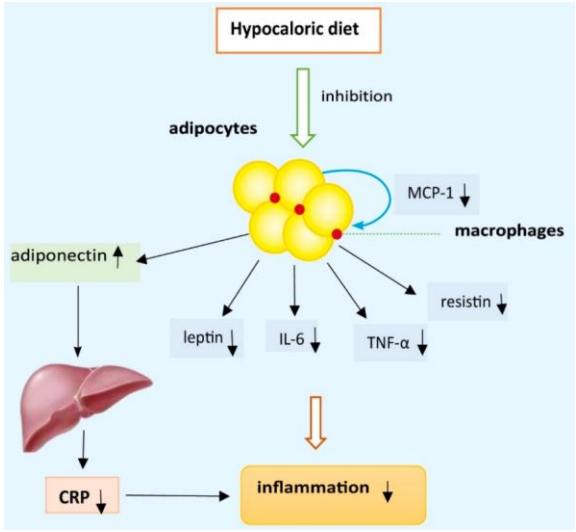
Role of the gut microbiota in arteriosclerosis; Annika Lindskog Jonsson et al; nature reviews cardiology 2016.

Patients are getting younger…



Increasing lipids with risk of worsening cardiac damage n 1595 adolescents: A 7- year longitudinal and mediation study;Andrew O et al; Research Article 02/2024

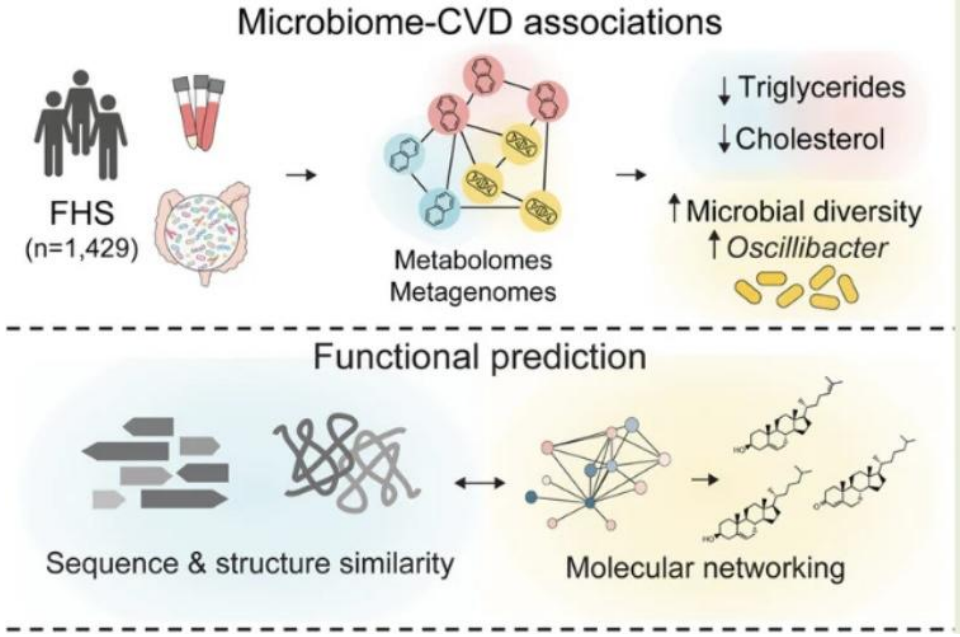
...Silent inflammation



- Loss of over 10 kilograms improves insulin resistance and lipid levels
- CRP and leucocyte decline reduce silent inflammation
- Regulative immunosuppressive T cells improve metabolism and inflammation markers

Weight loss is a critical factor to reduce inflammation; Vittoria Emanuele Bianchi et al; Clinical Nutrition Espen 2018; Effect of weight loss and longterm weight maintenance with diets varying protein and glycemic index on cardiovascular diseases; Gögebakan et al; Circulation 2011.

Oscillobacter – Framingham study 2024

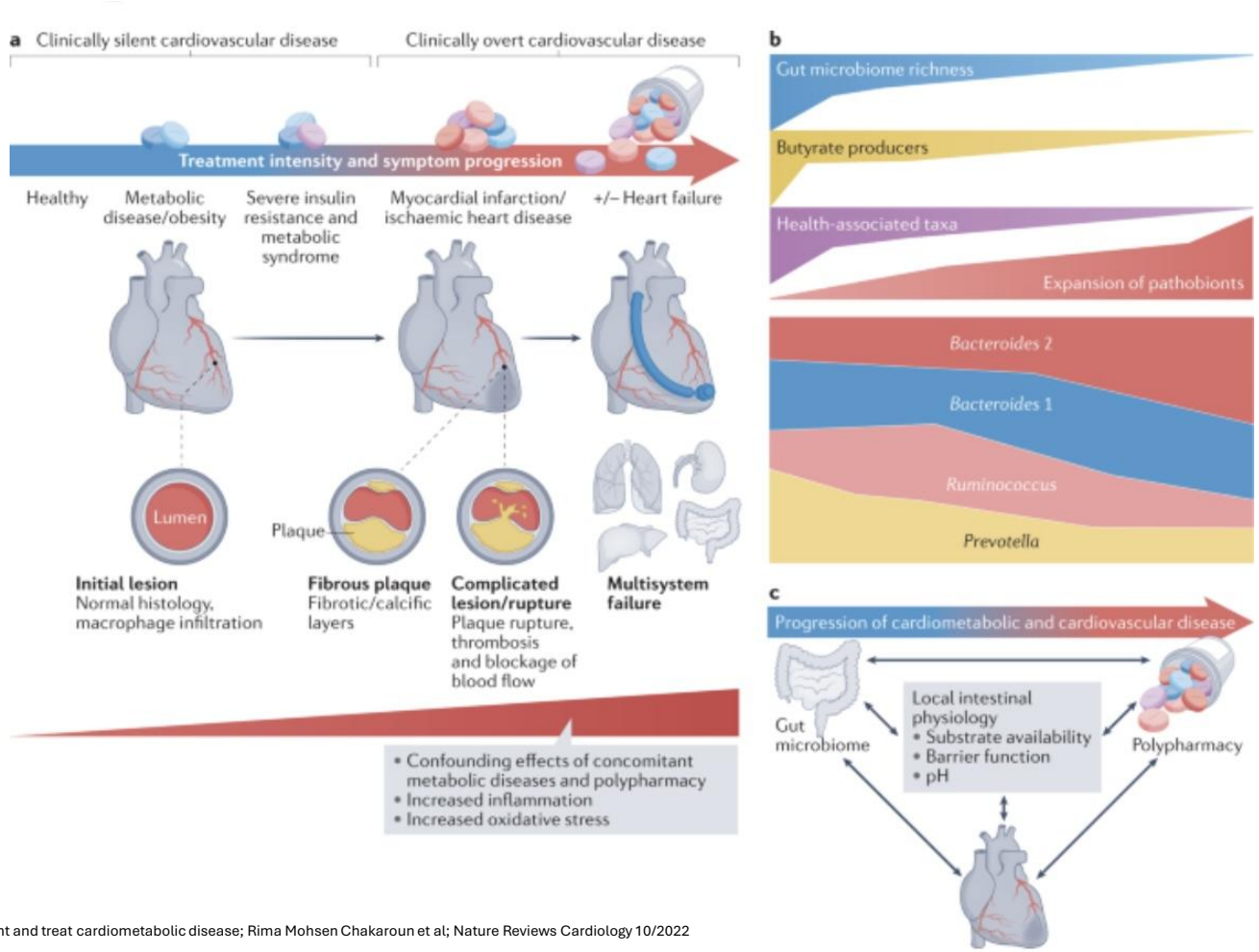


Source:
Cell, 187(8), 2024

What Gut Bacteria Reduce Your Risk of Heart Disease, and How?

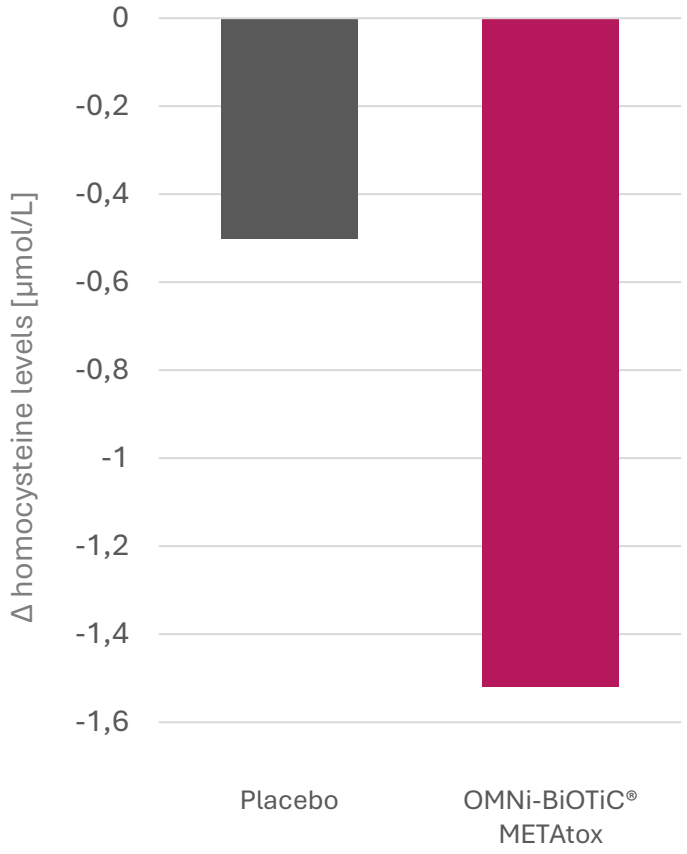
- Discoveries from a Study Involving 1400 People on *Oscillibacter* and Cholesterol

Preventive cardiology



The Potential of tailoring the gut microbiome to prevent and treat cardiometabolic disease; Rima Mohsen Chakaroun et al; Nature Reviews Cardiology 10/2022

OMNi-BiOTiC® *METAtox* reduces homocysteine levels



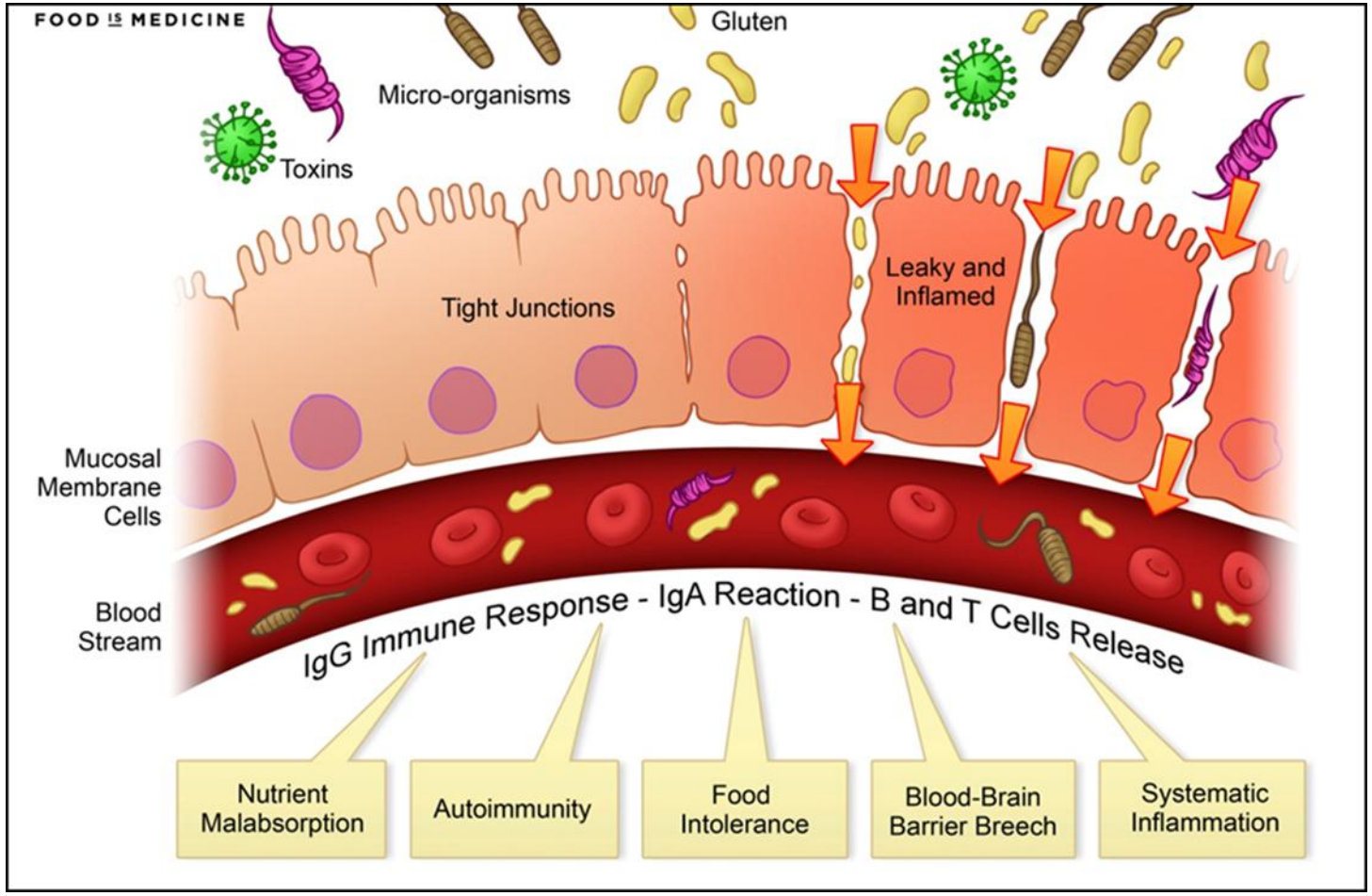
Homocysteine
independent risk factor for coronary heart disease, venous thrombosis, and stroke

After 3 months of probiotic supplementation:

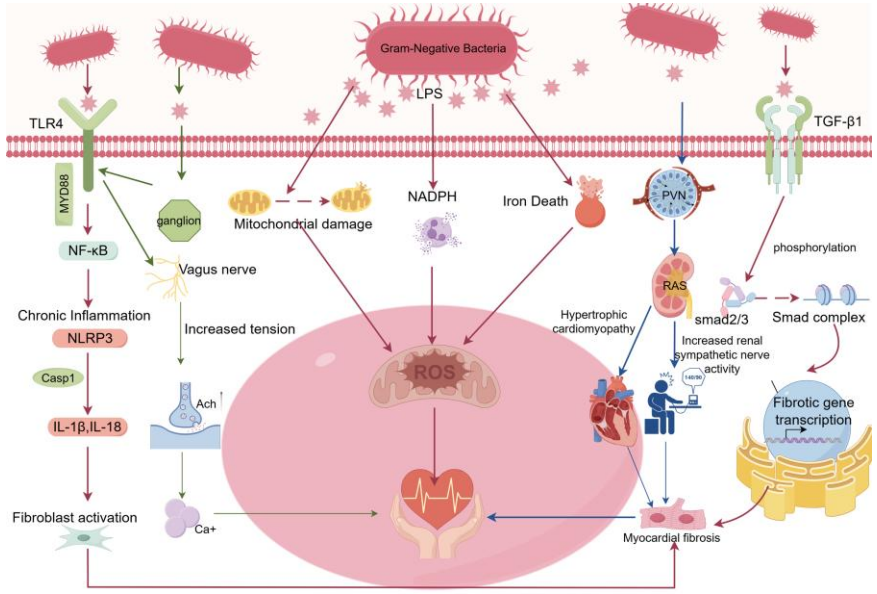
- **significant reduction in plasma homocysteine levels**

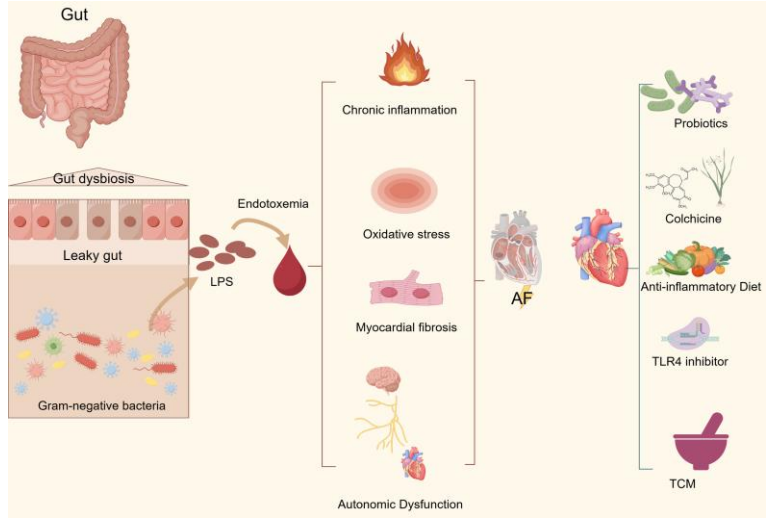
Majewska, K. et al. (2020) The Multispecies Probiotic Effectively Reduces Homocysteine Concentration in Obese Women: A Randomized Double-Blind Placebo-Controlled Study," Journal of Clinical Medicine: 9(4):998. doi: 10.3390/JCM9040998.c

Leaky Gut Syndrome



Leaky gut



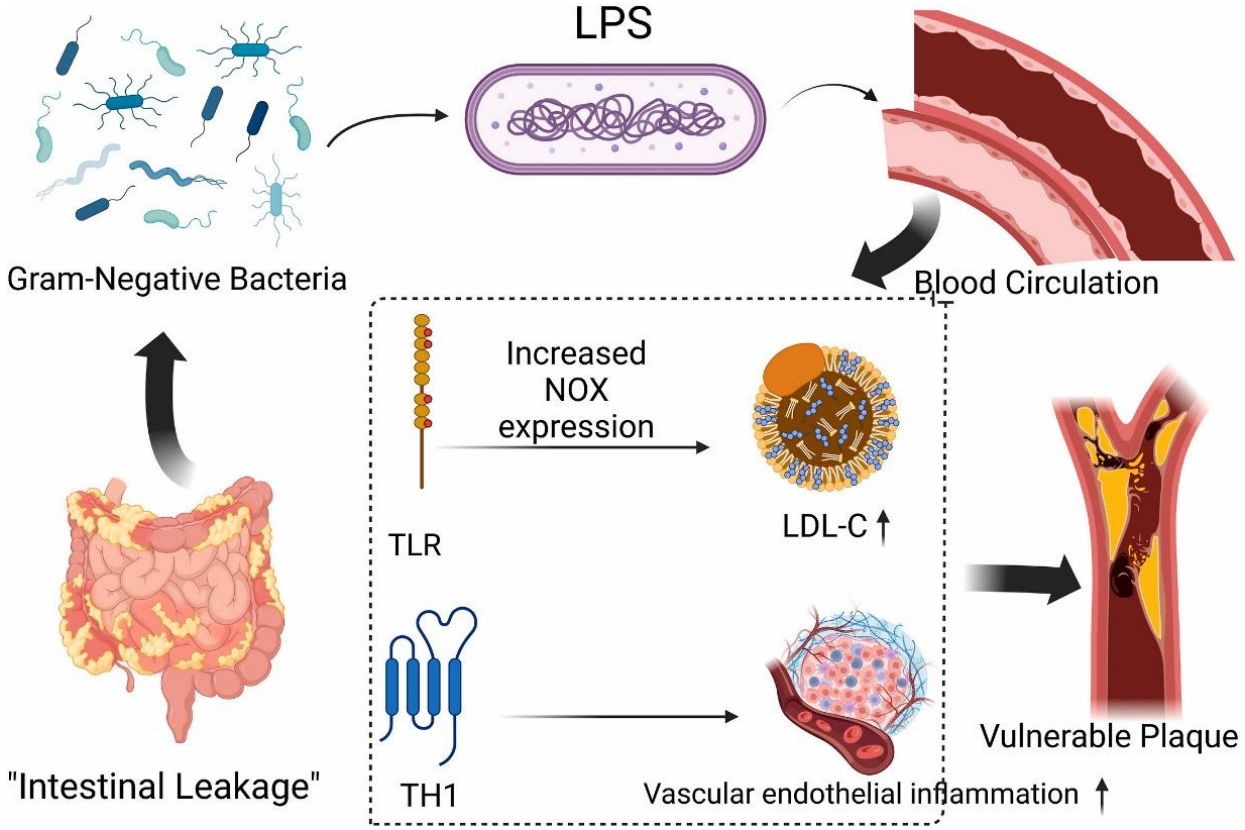


1. Caused by:
   - drugs (antibiotics, PPI,…)
   - stress
   - unhealthy diet
   - etc.
2. the gut microbiome changes
   - Reduction of diversity
   - Dysbiosis: pathogens, less SCFAs are produced
3. this has severe consequences:

gut inflammation → reduction of mucosa → leaky gut → liver is damaged → detoxification is not working properly → systemic poisoning (endotoxemia) → systemic inflammation – LPS- atrial fibrillation /platelet activation/plaque rupture

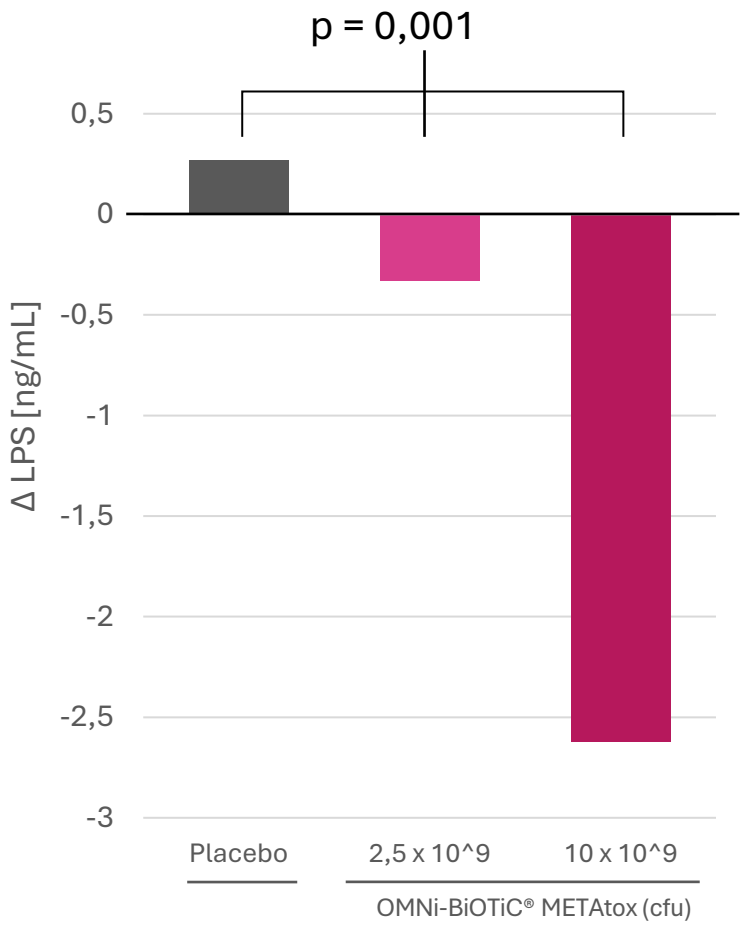
Gut-heart axis disruption and LPS translocation: driving atrial fibrillation through inflammatory storm and fibrotic mechanism;Chunxiao Wand et al; Cardiovascular Endocrinology;02/2026; Gut-derived low grade endotoxaemia, atherothrombosis and cardiovascular disease;francesco Violi et al;Nat Rev Cardiol 2022;07/2022;

LPS – vulnerable plaque



Research Development on gut microbiota and vulnerable atherosclerotic plaque; Shujiao Zheng et al; Heliyon 02/2024

OMNi-BiOTiC® *METAtox* reduces lipopolysaccharide concentration in serum

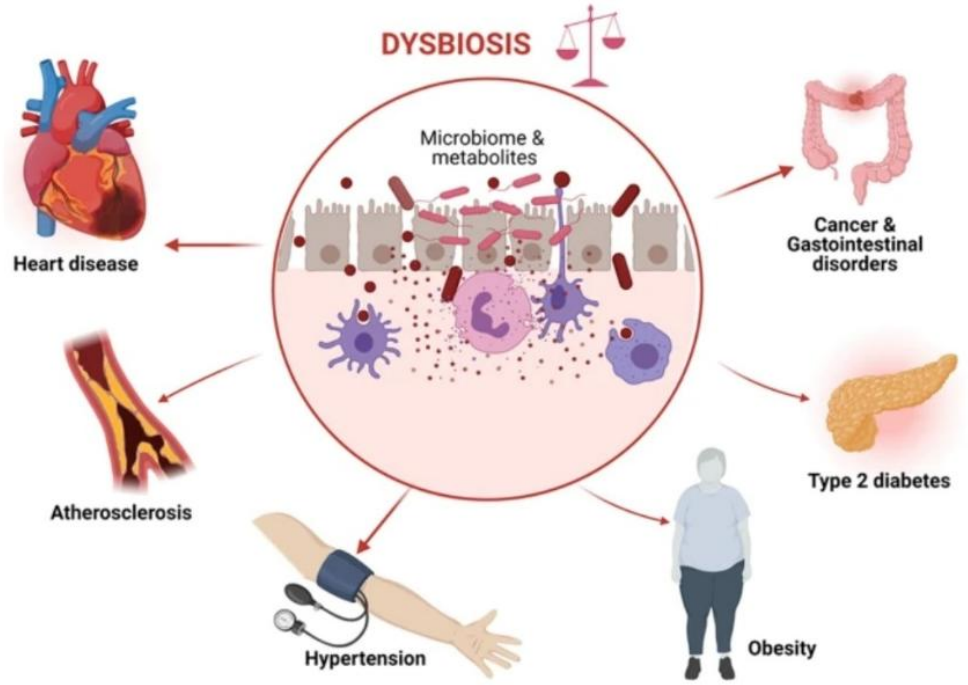


After 12 weeks of supplementation with the multispecies probiotic:

- **Improved intestinal barrier function**
  → Reduced serum LPS concentration

Szulińska, M. et al. (2018) Dose-Dependent Effects of Multispecies Probiotic Supplementation on the Lipopolysaccharide (LPS) Level and Cardiometabolic Profile in Obese Postmenopausal Women: A 12-Week Randomized Clinical Trial. Nutrients.

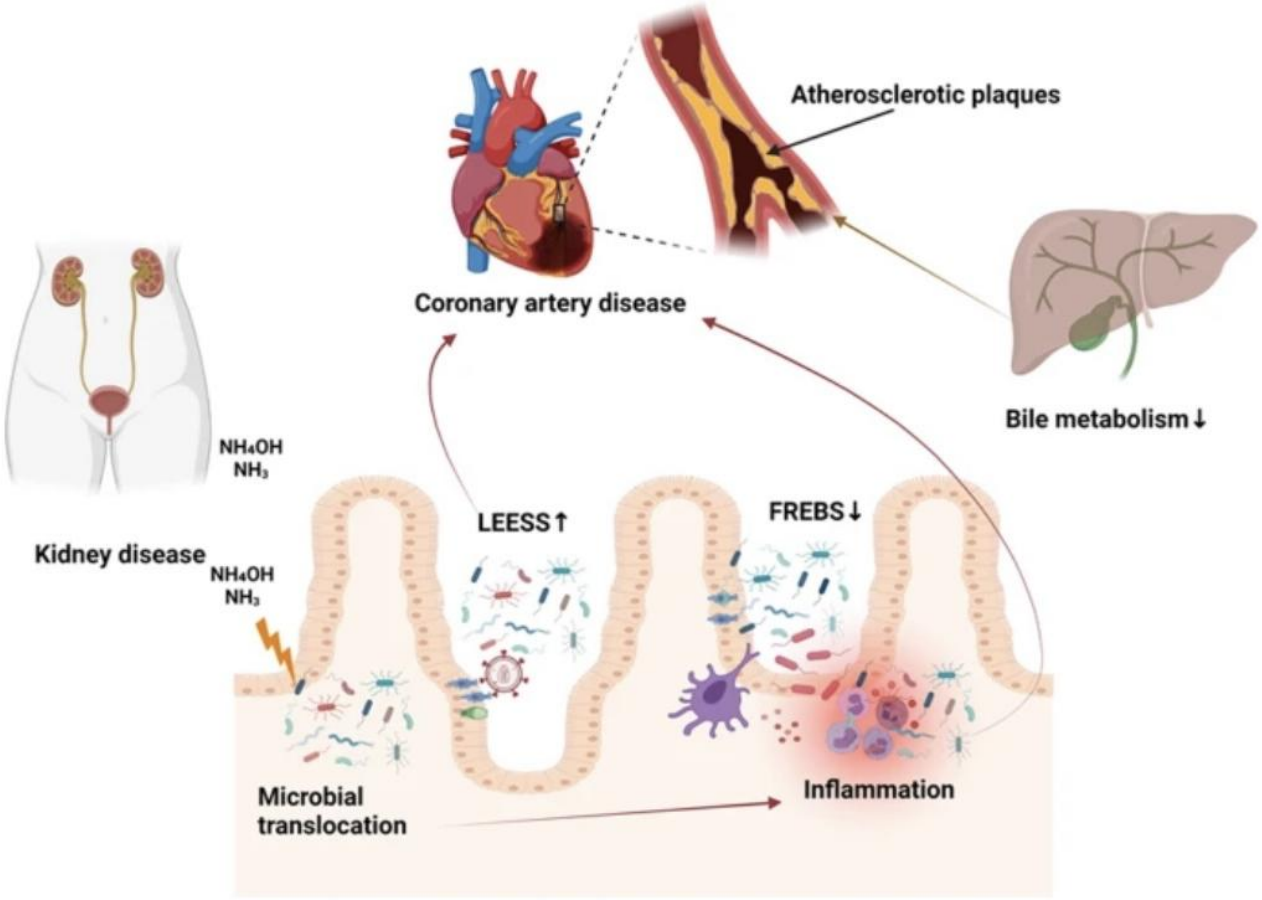
Diseases associated with dysbiosis



Abnormal changes in the composition of the microbiota (dysbiosis) is positively associated with pathogenesis and propagation of heart disease, type 2 diabetes mellitus, cancer, and gastrointestinal disorders.

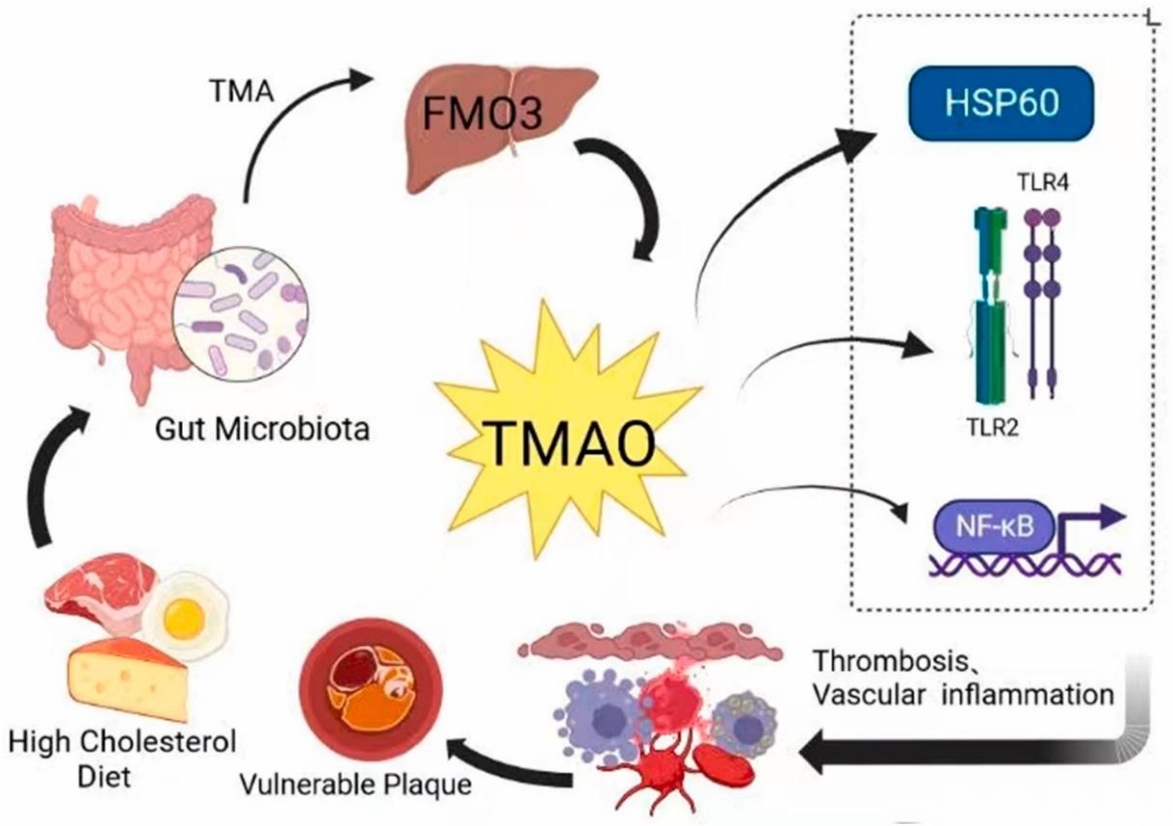
Recent advances in modulation of cardiovascular diseases by the gut microbiota; Sepiso K.Masenga et al; Journal of Human Hypertension 36, 2022

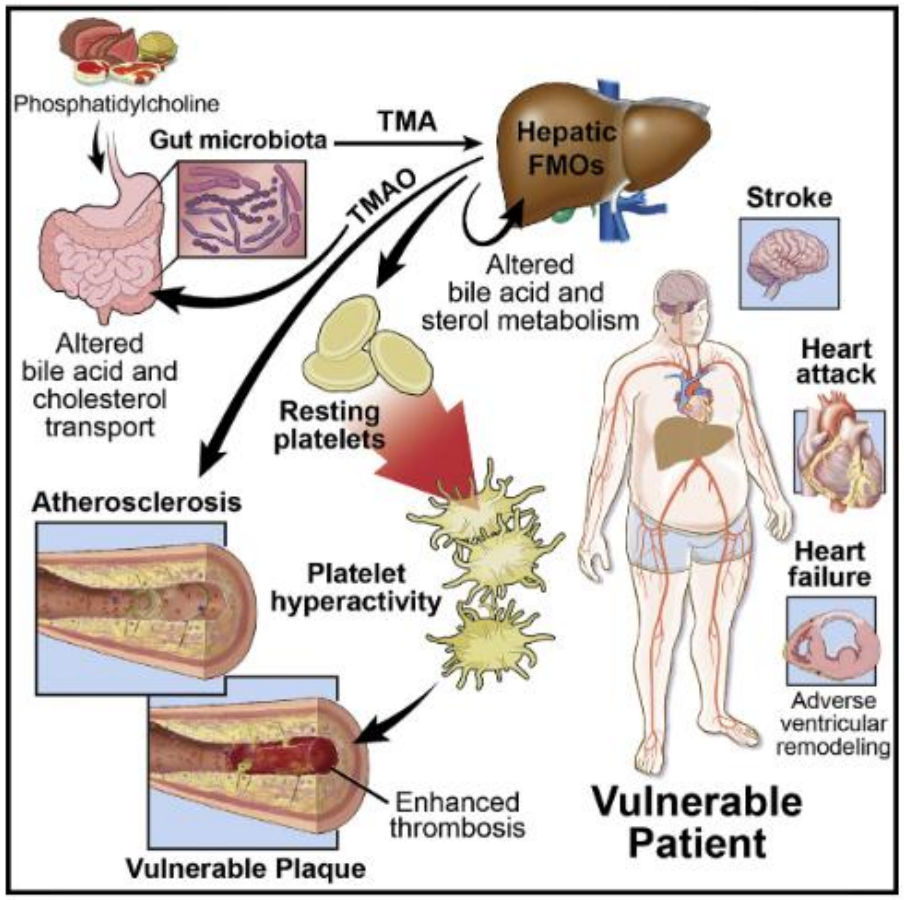
Leaky gut – microbiota translocation



Recent advances in modulation of cardiovascular diseases by the gut microbiota; Sepiso K.Masenga et al; Journal of Human Hypertension 36, 2022

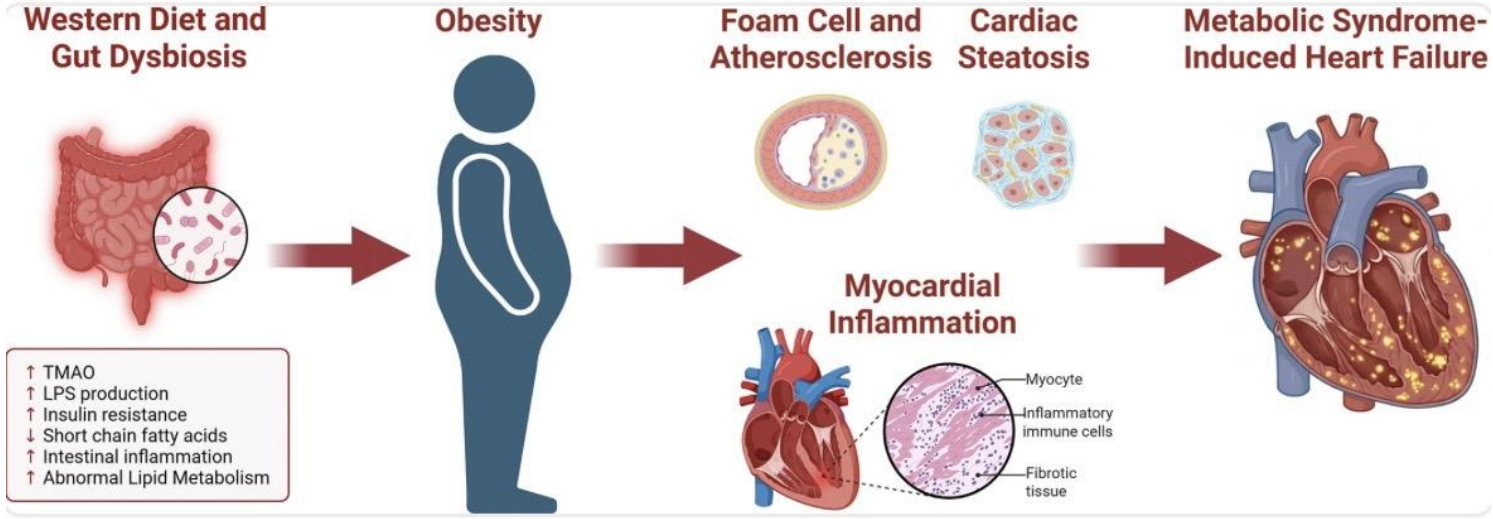
Western diet - TMAO

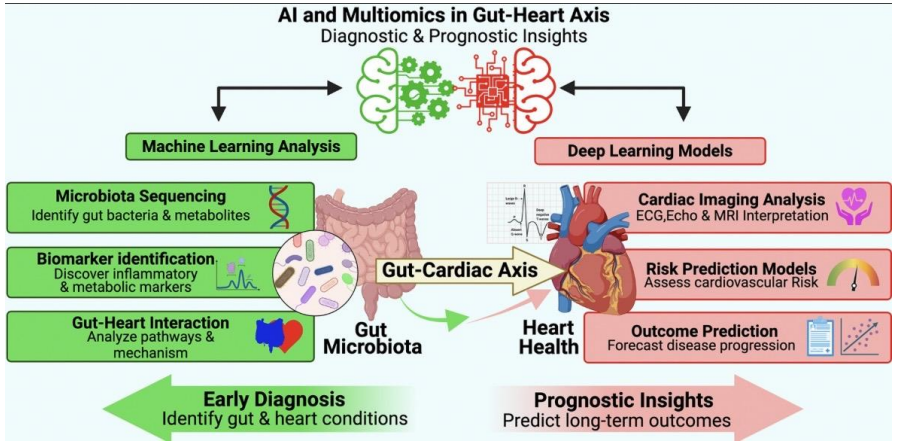




Research development on gut microbiota and vulnerable atherosclerotic plaque; Shujiao zheng et al; Heliyon 10 (2024); Gut microbial Metabolite TMAO enhances platelet hyperreactivity and thrombosis risk;Weifei Zhu et al; Cell;2016;

Metabolic syndrome and a broke heart: trust your gut or risk your heart





Metabolic syndrome and a broken heart: trust your gut or risk your heart;Jeffery D Salomon et al; Am J Physiol heart Circ 2026

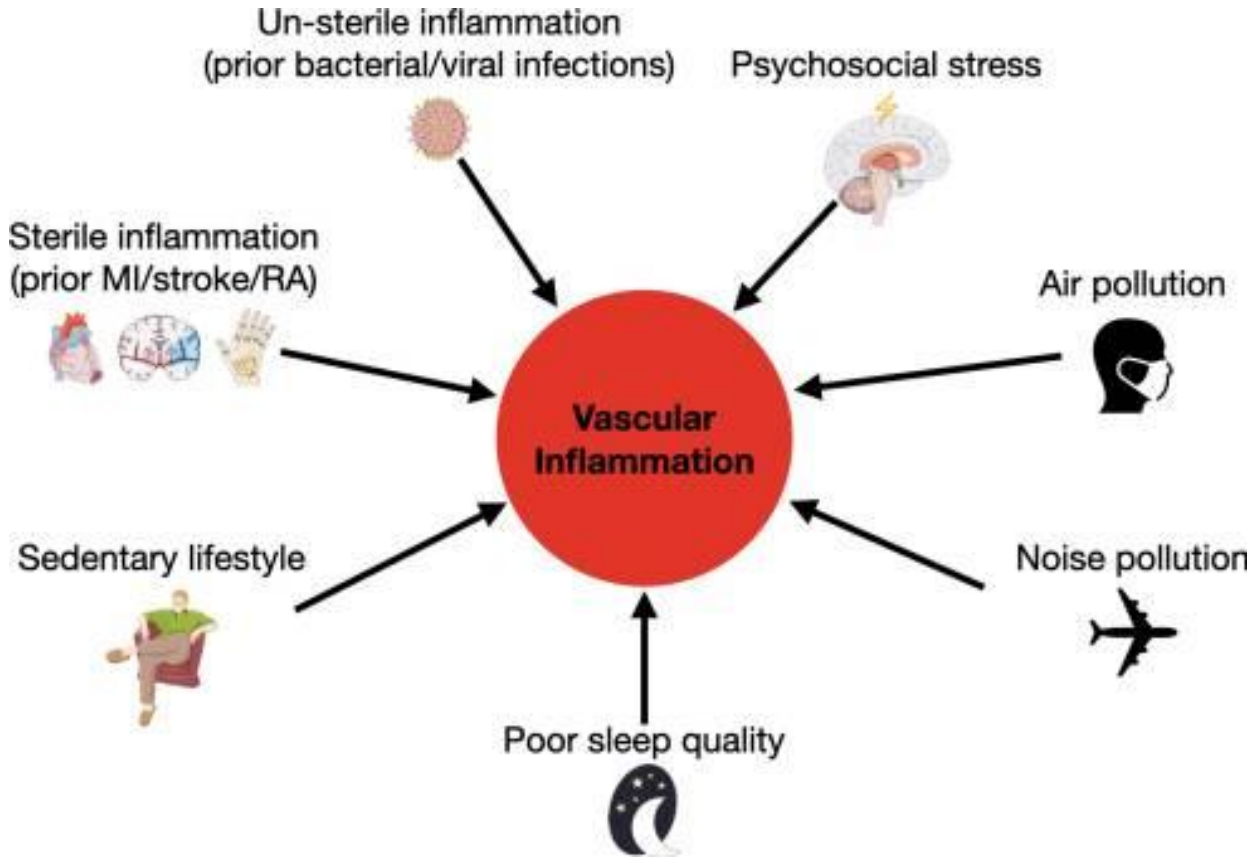
A Western-Style Diet Wipes Out Memory and Learning

“A Western-style diet stops critical memory functions from working properly, a new study finds. People who habitually eat unhealthy foods showed slower learning and poorer memory.”



Psychologist, Jeremy Dean, PhD is the founder and author of PsyBlog. He holds a doctorate in psychology from University College London and two other advanced degrees in psychology.

All about inflammation



Hinterdobler J, Schunkert H, Kessler T, Sager HB. Impact of Acute and Chronic Psychosocial Stress on Vascular Inflammation. Antioxid Redox Signal. 2021 Dec 20;35(18):1531-1550. doi: 10.1089/ars.2021.0153. Epub 2021 Sep 14.

23 mio CVD in 2030

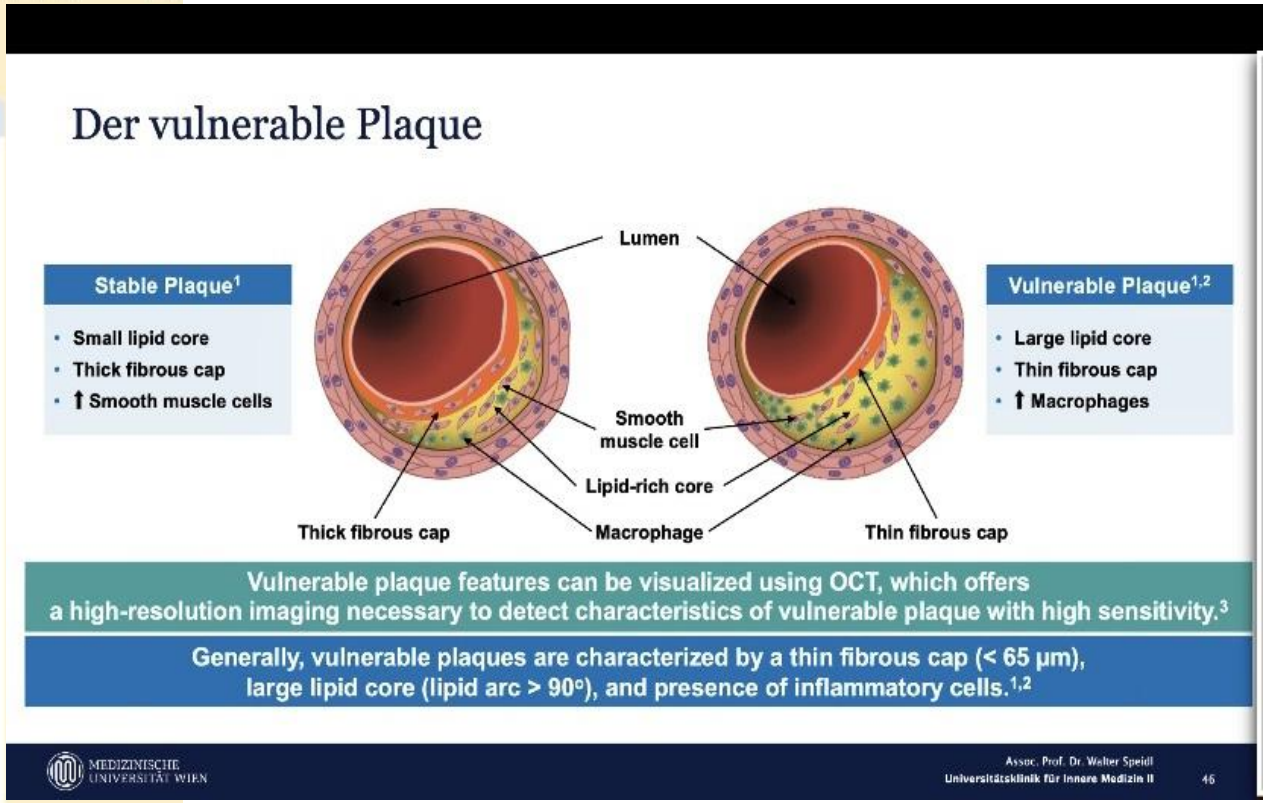
Review article

Research development on gut microbiota and vulnerable atherosclerotic plaque

Shujiao Zheng [a 1], Zuheng Liu [b 1], Haiyue Liu [c 1], Jie Ying Lim [b], Dolly Wong Hui Li [b], Shaofeng Zhang [b], Fang Luo [b], Xiujing Wang [b], Changqing Sun [b], Rong Tang [b], Wuyang Zheng [b], Qiang Xie [a]

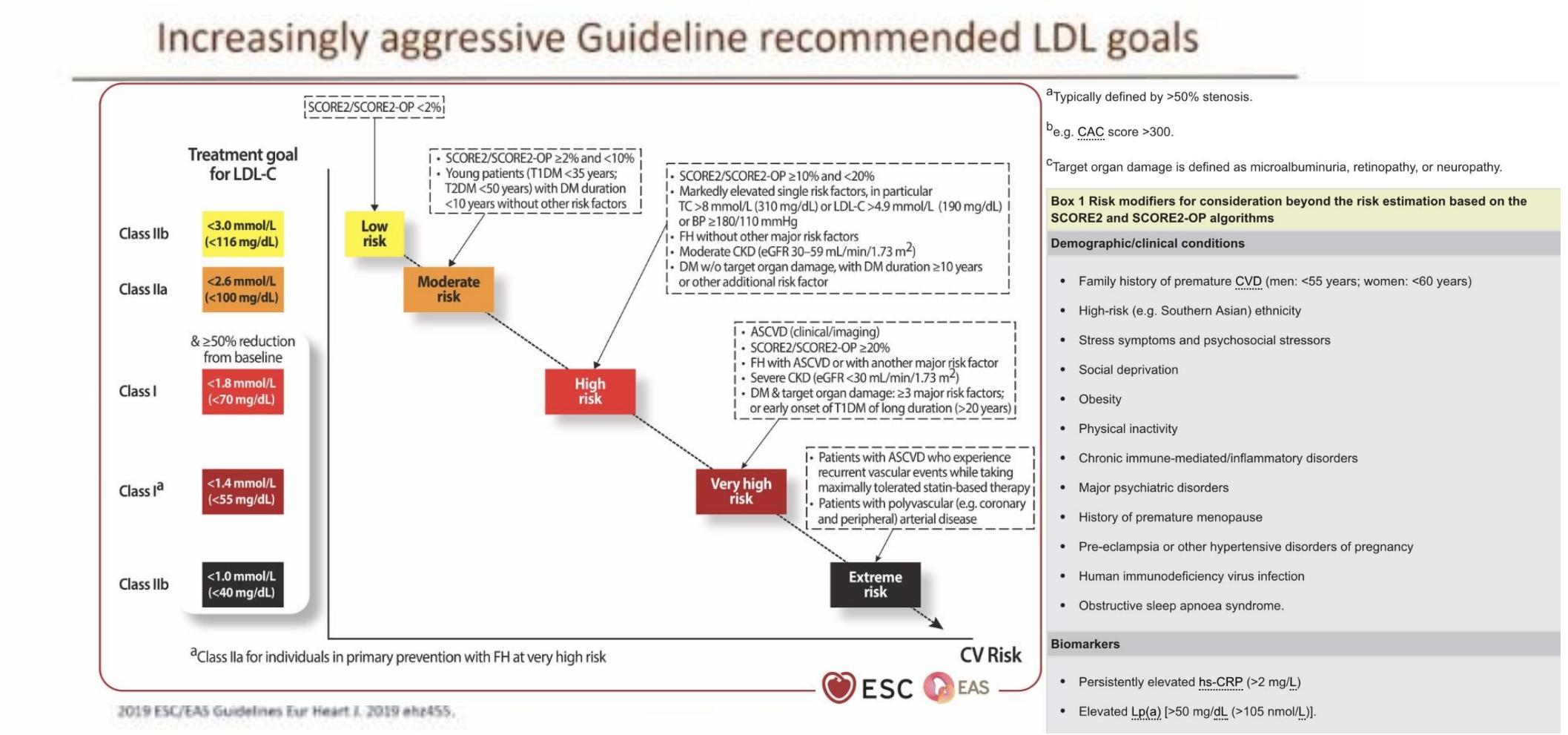
Why statins?





Tsujita, K., Sugiyama, S., Sumida, H., Shimomura, H., Yamashita, T., Yamanaga, K., Komura, N., Sakamoto, K., Oka, H., Nakao, K., Nakamura, S., Ishihara, M., Matsui, K., Sakaino, N., Nakamura, N., Yamamoto, N., Koide, S., Matsumura, T., Fujimoto, K., Tsunoda, R.,PRECISE–IVUS Investigators (2015). Impact of Dual Lipid-Lowering Strategy With Ezetimibe and Atorvastatin on Coronary Plaque Regression in Patients With Percutaneous Coronary Intervention: The Multicenter Randomized Controlled PRECISE-IVUS Trial. Journal of the American College of Cardiology, 66(5), 495–507.

Where is your LDL goal?



[a]Typically defined by >50% stenosis.

[b]e.g. CAC score >300.

[c]Target organ damage is defined as microalbuminuria, retinopathy, or neuropathy.

Box 1 Risk modifiers for consideration beyond the risk estimation based on the SCORE2 and SCORE2-OP algorithms

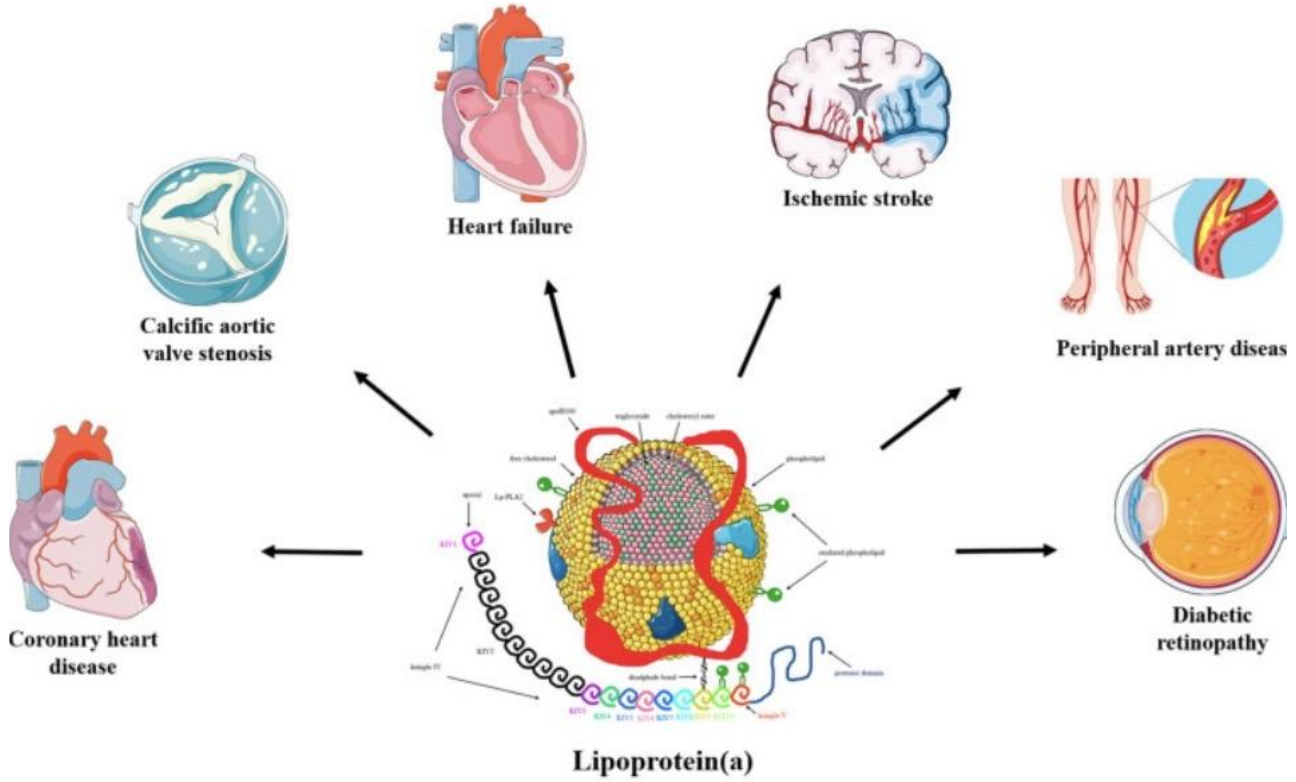
Demographic/clinical conditions

- Family history of premature CVD (men: <55 years; women: <60 years)
- High-risk (e.g. Southern Asian) ethnicity
- Stress symptoms and psychosocial stressors
- Social deprivation
- Obesity
- Physical inactivity
- Chronic immune-mediated/inflammatory disorders
- Major psychiatric disorders
- History of premature menopause
- Pre-eclampsia or other hypertensive disorders of pregnancy
- Human immunodeficiency virus infection
- Obstructive sleep apnoea syndrome.

Biomarkers

- Persistently elevated hs-CRP (>2 mg/L)
- Elevated Lp(a) [>50 mg/dL (>105 nmol/L)].

Lipoprotein(a) measurement – at least once a lifetime



How bad is Lipoprotein a;Dominik Lajsz; Globe Medic;

Stress and digestion

- **85% of people are feeling that stress affects their digestive organs**

- ✓ „perforated“ intestinal surface (leaky gut)
- ✓ toxins, pathogens and allergens enter the body unhindered
- ✓ **activation of inflammatory substances** in the intestine
- ✓ pathogenic germs can multiply and settle easily

Synbiotic therapy significantly improves the intestinal barrier function!

Advances in Microbiology, 2013, 3, 212-221
doi:10.4236/aim.2013.32032 Published Online June 2013 (http://www.scirp.org/journal/aim)

Scientific Research

Clinical Studies Evaluating Effects of Probiotics on Parameters of Intestinal Barrier Function

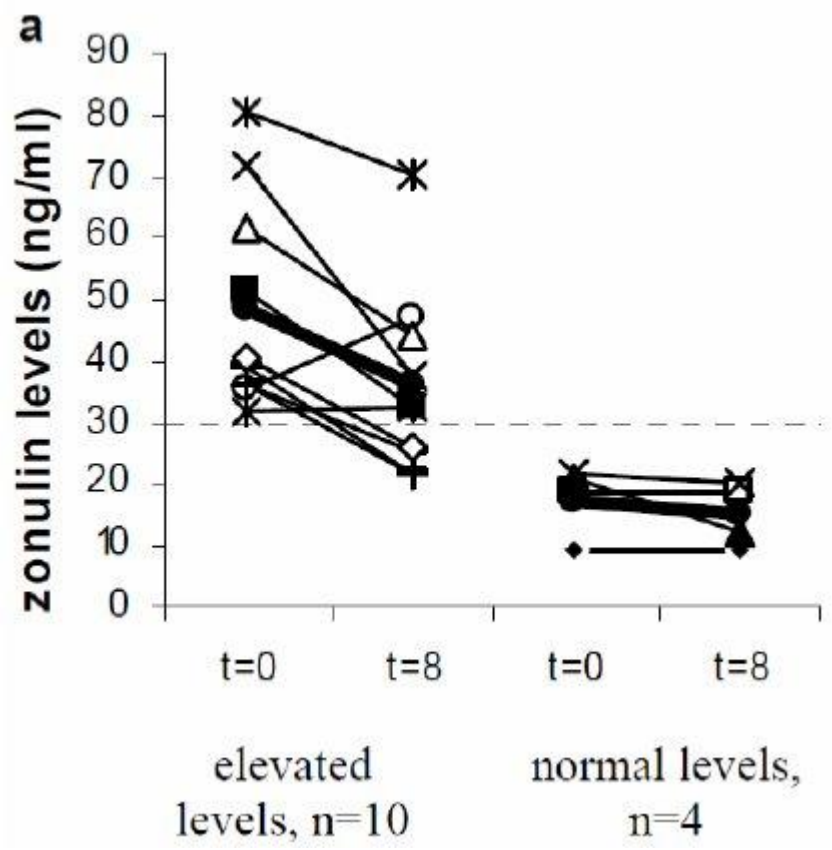
Saskia van Hemert[1*], Jurre Verwer[1], Burkhard Schütz[2]
[1]Winclove Probiotics, Amsterdam, the Netherlands
[2]Biovis Diagnostik MVZ GmbH, Limburg-Offheim, Germany
Email: *Saskiavanhemert@winclove.nl

Study design

- **Subjects** 4 people with gastrointestinal problems
- **Methods** 1 x daily synbiotic therapy for 8 weeks
  double-blinded, randomized, placebo-controlled
- **Parameters** fecal zonulin
  α-1-antitrypsin
  hsCRP

Hemert, Schütz et al, Clinical studies evaluating effects of probiotics on parameters of intestinal barrier function, Advances in Mikrobiology, 2013

Synbiotic therapy reduces *Leaky Gut*

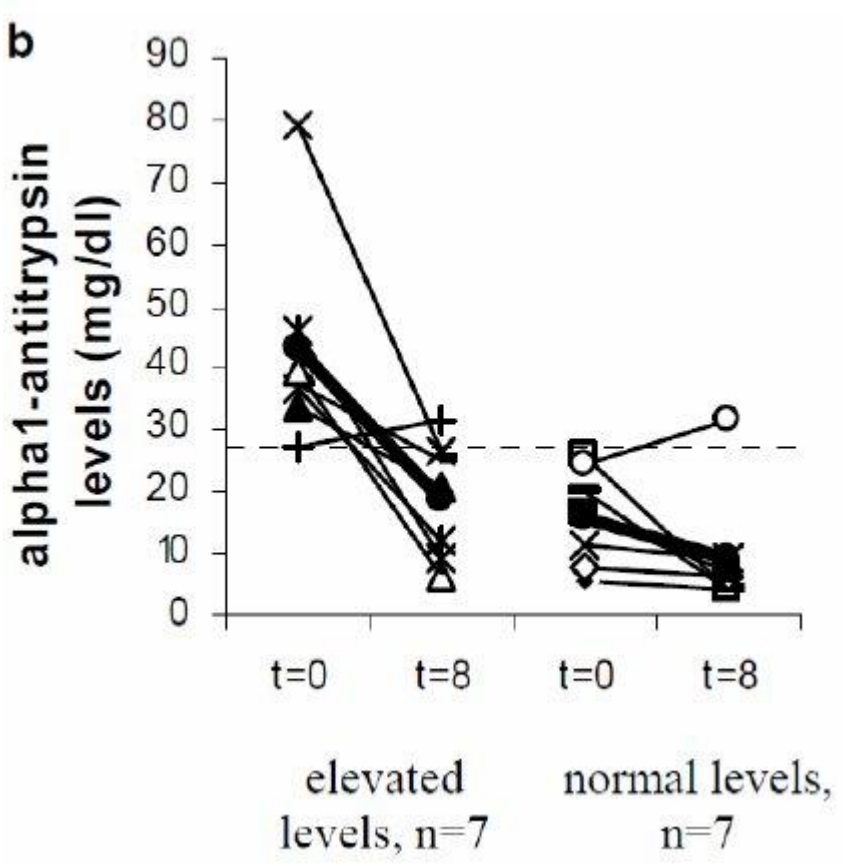


< normal range
30 ng/ml

- **Zonulin:** parameter for **opening of *tight junctions*** and associated ***leaky gut***
- Zonulin levels were significantly reduced after 8 weeks ($p<0.01$)
- **reduced inflammation and *leaky gut***

Hemert, Schütz et al, Clinical studies evaluating effects of probiotics on parameters of intestinal barrier function, Advances in Mikrobiology, 2013

Synbiotic therapy reduces intestinal inflammation



normal range
27,2 mg/dl

- **α -1-Antitrypsin:** parameter for **inflammatory processes in the intestine**
- α-1-antitrypsin level and thus **inflammation** in 12 of 14 patients **significantly reduced** ($p<0.01$)

Hemert, Schütz et al, Clinical studies evaluating effects of probiotics on parameters of intestinal barrier function, Advances in Mikrobiology, 2013

Conclusion : Synbiotic therapy provides proven anti-inflammatory effects

- **8 weeks of Synbiotic therapy**

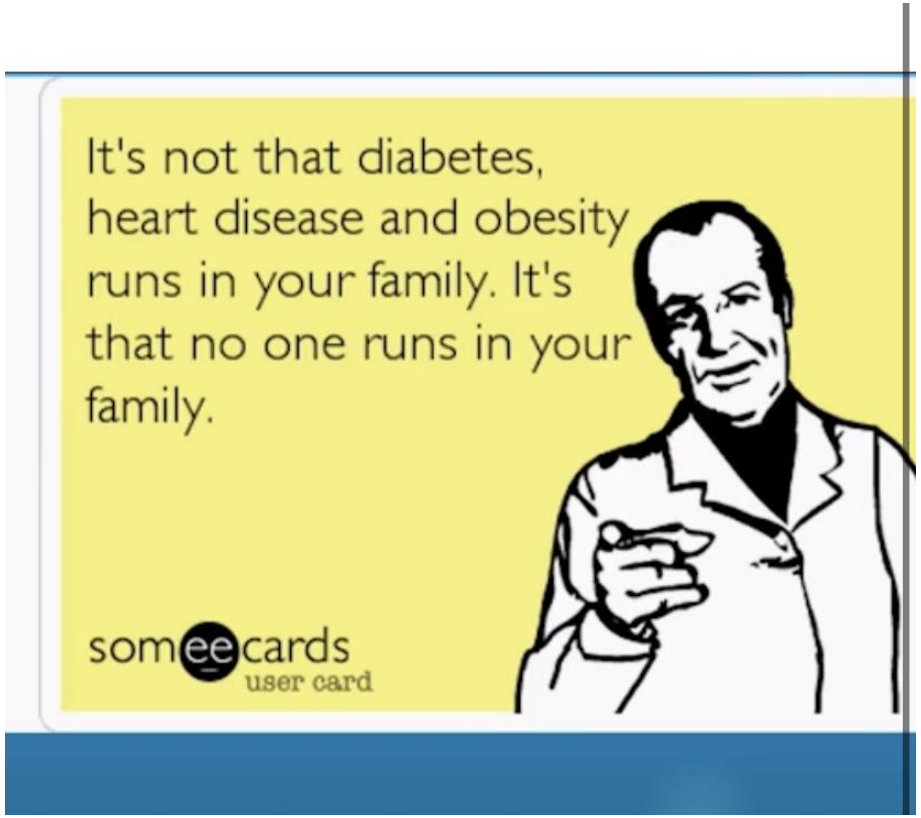
- **reduce the inflammation levels** both **systemically** (hsCRP) as well as on the **mucosa** (α-1-antitrypsin)
- and **strengthen the intestinal barrier** (zonulin)

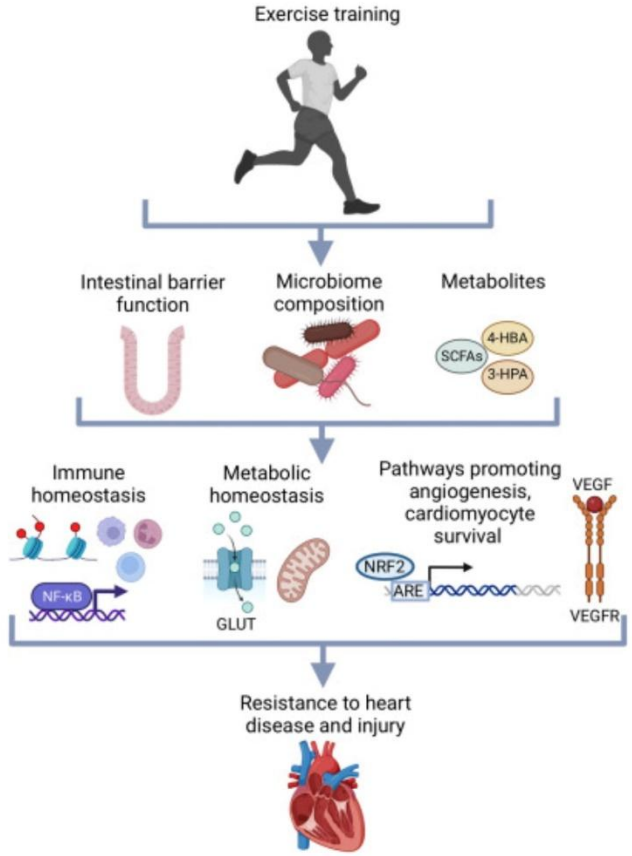
Hemert, Schütz et al, Clinical studies evaluating effects of probiotics on parameters of intestinal barrier function, Advances in Mikrobiology, 2013

Synbiotics in inflammation

- chronic, systemic inflammations, arteriosclerosis
- inflammations in the gut (irritable bowel syndrome,...)
- all diseases with high tendency of inflammation (e.g. rheumatism, arthrosis, MS, anorexia, chronic fatigue, ...)
- mental stress, burnout, depression,
- emotional/mental exhaustion, anxiety
- dementia, Parkinson‘s disease
- insomnia

.....all about lifestyle





Someecards, Intrinsic and Extrinsic Contributors to the Cardiac Benefits of exercise; Margaret H. Hastings PHD et al; JACC, 04/2024

Mediterranean diet and health



An increase in **life expectancy of 13.0 and 10.7 years** in males and females, respectively, when adopted at age 20.

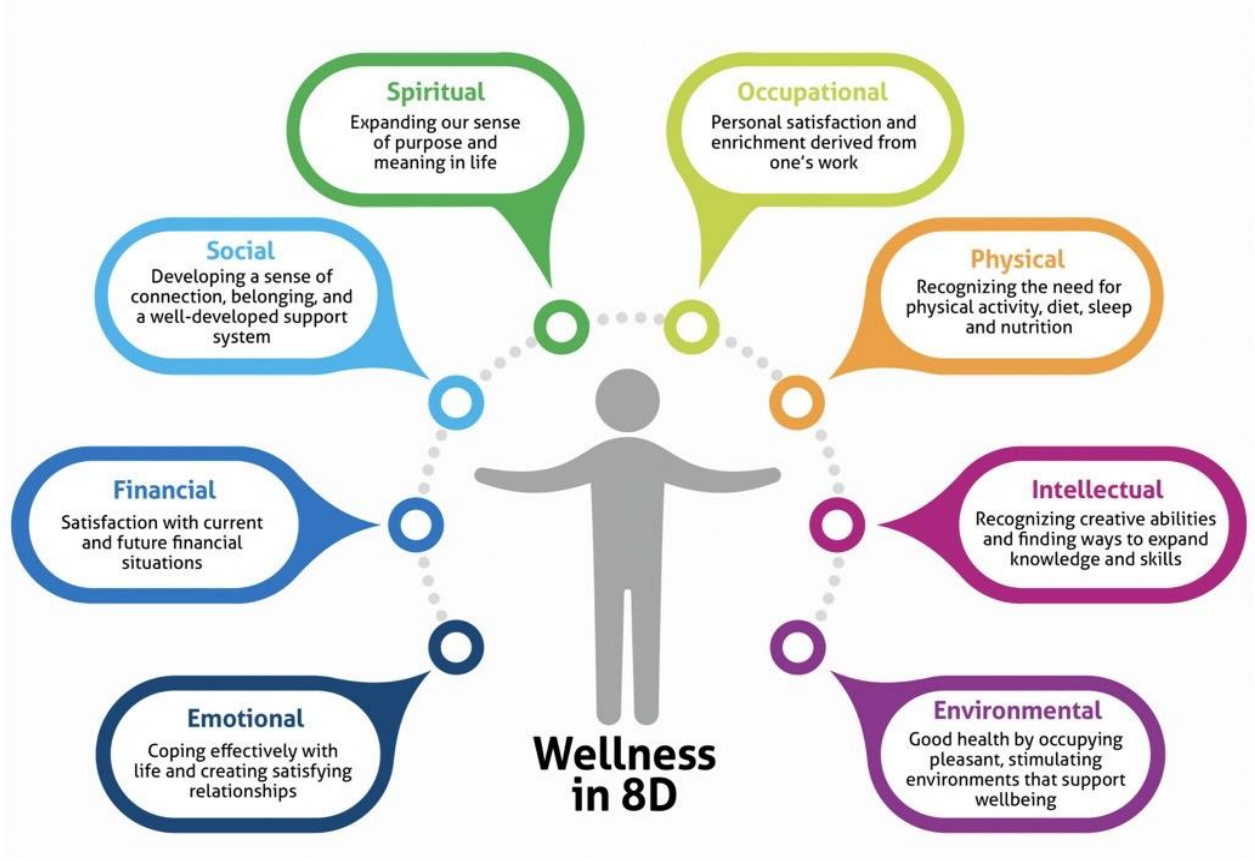
An increase in **life expectancy of 11.7 and 10.0 years** for men and women, respectively, when adopted at age 40.

An increase in **life expectancy of 8.8 and 8.0 years** for men and women, respectively, when adopted at age 60.

An increase in **life expectancy of 3.4 years** for participants when adopted at age 80.

The traditional Mediterranean diet has long been associated with a low risk of all-cause mortality, cardiovascular disease and some types of cancer.

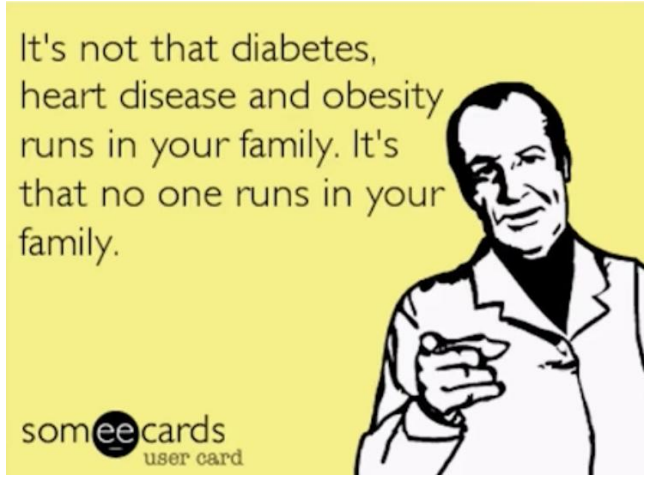
https://www.basenfasten.de/fragen-und-tipps/darauf-solltest-du-bei-oliven-unbedingt-achten/



Wellness in 2022: A model for everyone;Dana Fogleong;Wellness;2022

… All about lifestyle

- Losing weight will result in overall health benefits, including reducing cardiovascular disease
- Weight loss makes it possible to be more physically active
- Intentional weight loss through improved diet and more physical activity has direct benefits for metabolism
- Psychological benefits of weight loss can influence quality of life



Someecards

...150 min per week, a must!!!

General recommendations for exercise and sports in healthy individuals

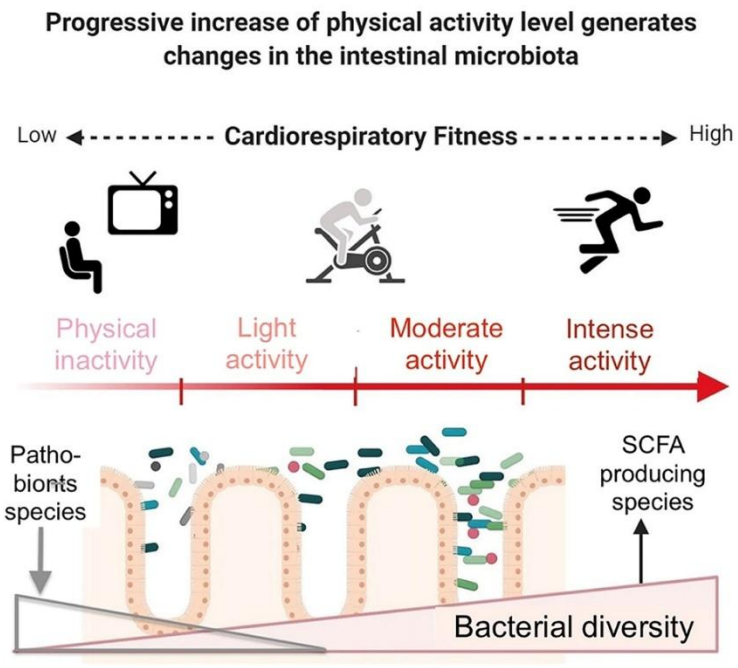
Recommendations	Class[a]	Level[b]
At least 150 min/week of moderate-intensity, or 75 min/week of vigorous-intensity aerobic exercise, or an equivalent combination thereof is recommended in all healthy adults.[113–118]	I	A
A gradual increase in aerobic exercise to 300 min/week of moderate-intensity, or 150 min/week of vigorous-intensity aerobic exercise, or an equivalent combination is recommended for additional benefits in healthy adults.[114,116]	I	A
Regular assessment and counselling to promote adherence and, if necessary, to support an increase in exercise volume over time are recommended.[119]	I	B
Multiple sessions of exercise spread throughout the week, i.e. on 4–5 days a week and preferably every day of the week, are recommended.[113,114]	I	B

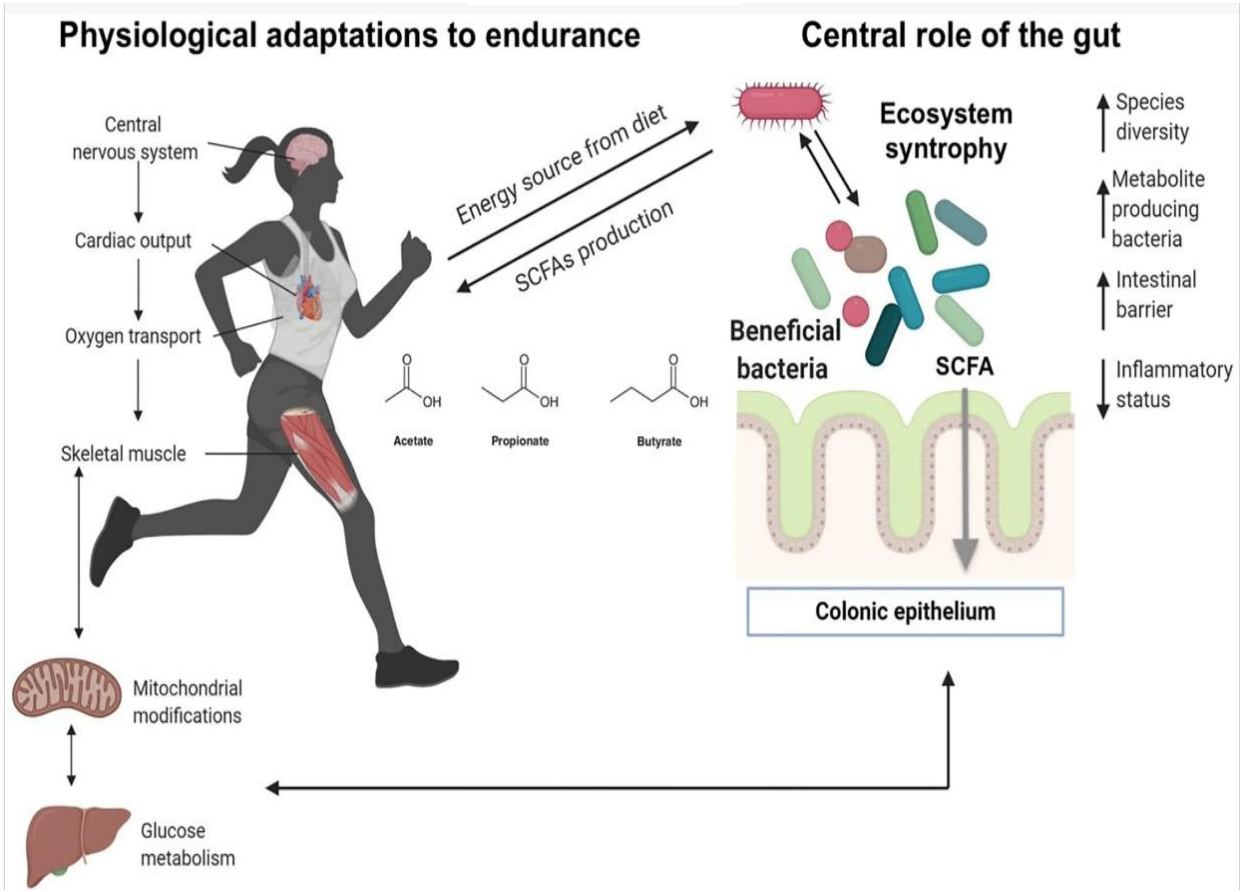
© ESC 2020

[a]Class of recommendation.
[b]Level of evidence.

ESC Guidelines Sports Cardiology and Exercise in patients with CVD 2020

Microbiome diversity and sport



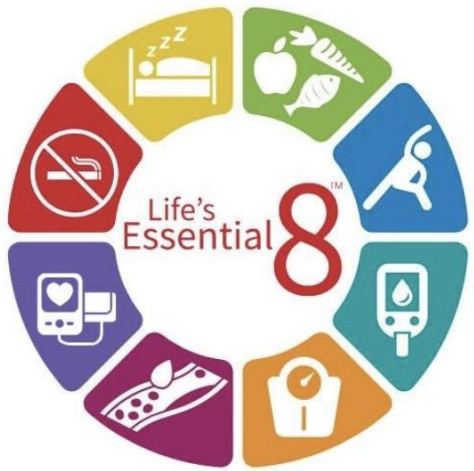


Interplay between excercise and gut microbiome in the context of human health and performance;Matthieu Clauss et al;Review article;96/2021

7

Know Life's Essential 8.

Follow the American Heart Association's Life's Essential 8, including eating smart, staying active, getting healthy sleep and more. Your heart and brain will thank you.



Thank you for your attention!

